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EXAMINER	
SHERALI, ISHRAT I	

ART UNIT	PAPER NUMBER
2621	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/040,693	FAN, ZHIGANG	
	Examiner	Art Unit	
	Sherali Ishrat	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/72002/*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969)..

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-2 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 12-13 of copending Application 09965922 in view of Schettini et al. (Color Image Classification Using Tree Classifier, ITIM, IAMI , The Seventh Imaging Conference, Color Science, System and Application). Although the conflicting claims are not identical, they are not patentably distinct from each other because they cover the same subject matter, the difference between claim 1 of instant application and claim 12 of copending Application 09965922is that claim 1 of instant application require edge orientation feature and claim 12 of copending application recites edge feature.

In the same field of endeavor Schettini discloses obtaining edge orientation feature (Schettini, page 270, left-column, lines 29-30, edge directions).

Therefore it would have been obvious at the time the invention was made to use/determine edge directions features.

This is provisional obviousness-type double patenting rejection because the conflicting claims have not been patented the conflicting claim have not been patented.

3. Claim 16 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 29-30 of copending Application 09965922. Although the conflicting claims are not identical, they are not patentably distinct from each other because they cover the same subject matter, the difference between claim 16 of instant application and claims 29-30 of copending Application 09965922 is that claim 16 of instant application require one-dimensional, two-dimensional and three-dimensional color discreteness features and claims 29-30 only require color discreteness feature . However claims limitation of both instant application and copending application 09965922 require selection of only two features and two features such as edge feature and color discreteness [one-dimensional color discreteness] features are recited in both claim 16 of instant application and claims 29-30 of copending application 09965922.

This is provisional obviousness-type double patenting rejection because the conflicting claims have not been patented the conflicting claim have not been patented.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 3-4, 7-9, 12-14 and 19-20 are rejecteded rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 3, claim in lines 5-6, recites "processing the two-dimensional histogram using the equation $H(x) = (\text{SUM } HT(x,y)^2)^{1/2}$ wherein the summation is for all y values". This limitation is indefinite because it is not understood what various variables stand for in the equation. Proper correction is required.

Regarding claim 4, claim in lines 1-2, recites "the algorithm associated with the edge orientation feature is EO = -SUM H(x)log H(x). This limitation is indefinite because it is not understood what various variables stand for in the equation. Proper correction is required.

Regarding claims 7 and 12, claims in lines 1-2, recite "the two-dimensional color discreteness feature include one or more of three two dimensional color discreteness features". This limitation is indefinite because it is in the form of improper English and it is not understood color feature is two-dimensional or three-dimensional. Proper correction is required.

Regarding claims 8, 13 and 19 claims in lines 1-3, recite "each two-dimensional color discreteness feature is represented by algorithm". This limitation is indefinite because it is not understood what various variables stand for in the algorithm.

Regarding claims 9, 14, and 20 claims in lines 3-4 , recite "three - dimensional color discreteness feature is represented by algorithm". This limitation is indefinite because it is not understood what various variables stand for in the algorithm.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-2, 5-6, 10-11 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Schettini et al. (Color Image Classification Using Tree Classifier, ITIM, IAMI, The Seventh Imaging Conference, Color Science, System and Application)..

Regarding claim 1, Schettini discloses classification of an input image in natural picture or graphics classes (Schettini, in page 269, Paragraph Abstract, left-column, lines 2-5, states "classify color images in predefined classes,

classification problem of distinguishing photographs from artworks". This corresponds to classification of an image in natural picture or graphics), comprising:

extracting an edge orientation feature from input image (Schettini, page 270, Paragraph Image Description, left-column, lines 4-6, states "extract low-level representation in terms of color, texture and shape [edge] features" and Schettini, page 270, Paragraph Image Description, left-column, lines 30-35, states, "a histogram of filtered contours [edges] directions is computed". This corresponds to extracting an edge orientation features from input image);

processing edge orientation feature using an algorithm associated with feature (Schettini, page 270, Paragraph Image Description, left-column, lines 30-35 states, "a histogram of filtered contours [edge] directions is computed". This corresponds to processing feature using an algorithm associated with feature);

comparing the result of the feature algorithm to one or more threshold (Schettini, page 269, Paragraph Tree Classifier, right-column, lines 12-13, states, "In our problem the **predictors are the features** indexing the images" and Schettini, in page 269, Paragraph Tree Classifier, right-column, lines 25-30, states "The candidate splits are generated by a set of question on values of predictors [features, edge feature] , which are different depending on the nature of predictor [features, edge feature]. For a numerical predictor [feature], the admissible question are {is $x < c$?} where x denotes the value of predictor

[feature]". This corresponds to comparing the result of the feature algorithm to one or more threshold) and

if according to previously determined rules, any comparison is determinative of the input image, classifying the input in either the natural picture or graphics according to previously determined rules, otherwise indicating the result is indeterminate (Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the predictors [features] are searched one by one and for each predictors [features] the best split [classification] is found. Then the best single splits are compared. The process starts at the root and continues on until some rule is satisfied" and Schettini in page 271, Paragraph Results left-column, lines 2-6, states "we have experimented our approach on high-level classification of classifying of image either as photograph or an art artwork. Of course both the classes could be further split". This corresponds to if according to previously determined rules, any comparison is determinative of the input image, classifying the input in either the natural picture or graphics according to previously determined rules).

Regarding claim 2, Schettini discloses processing the input image to detect edges (Schettini, page 270, Paragraph Image Description, left-column, lines 30-35 states, "edges are extracted using Canny's edge detector");

creating edge map (Schettini, page 270, Paragraph Image Description, left-column, lines 30-35 states, histogram of contours is computed which corresponds to edge map);

processing the edge map to connect the edges (Schettini, page 270, Paragraph Image Description, left-column, lines 30-35 states, "histogram of filtered contours directions [only high gradient pixels considered] which corresponds to processing the edge map to connect the edges); and

extracting one or more features from edge map (Schettini, page 270, Paragraph Image Description, left-column, lines 30-35 states, "histogram of edge direction is normalized". Histogram of edge direction corresponds to extracting one or more features).

Regarding claim 5, Schettini discloses classification of an input image in natural picture or graphics classes (Schettini, in page 269, Paragraph Abstract, left-column, lines 2-5, states "classify color images in predefined classes, classification problem of distinguishing photographs from artworks". This corresponds to classification of an image in natural picture or graphics), comprising:

performing a combination picture/graphics classifier on input image (Schettini, in page 269, Paragraph Abstract, left-column, lines 2-5, states "classify color images in predefined classes, classification problem of distinguishing photographs from artworks". This corresponds to performing combination of picture/graphics classification on input image and page 270, Paragraph Image Description, left-column, lines 1-6, states "significance of training set and quality of the features used to describe the image content are essential factors for good classification [combination picture/graphics classifier using color, texture and edge]. We have studied how to extract low-level

representation in terms of color, texture and shape [edge] features". This corresponds to performing combination of picture/graphics classification on input image using at least two features [edge, color discreteness and texture]),

using two or more features selected from the group consisting of edge features, texture and one dimensional color discreteness (Schettini, page 270, Paragraph Image Description, left-column, lines 1-6, states "significance of training set and quality of the features used to describe the image content are essential factors for good **classification** [combination picture/graphics classifier as discussed above]. We have studied how to extract low-level representation in terms of color, texture and shape [edge] features". This corresponds to performing combination of picture/graphics classification on input image using at least two features [edge, color discreteness and texture]);

comparing the results of the combination picture/graphics classifier for each feature selected for performance and (Schettini, page 269, Paragraph Tree Classifier, right-column, lines 12-13, states, "In our problem the **predictors are the features** indexing the images" and Schettini, in page 269, Paragraph Tree Classifier, right-column, lines 25-30, states "The candidate splits are generated by a set of question on values of predictors [features] , which are different depending on the nature of predictor [features]. For a numerical predictor [feature], the admissible question are {is x < c?} where x denotes the value of predictor [feature]". This corresponds to comparing the result of the feature algorithm to one or more threshold, Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the

predictors [features] are searched one by one and for each predictors [features] the best split [classification] is found. Then the best single splits are compared. The process starts at the root and continues on until some rule is satisfied),

if according to previously determined rules, any comparison is determinative of the input image, classifying the input in either the natural picture or graphics according to previously determined rules, otherwise indicating the result is indeterminate (Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the predictors [features] are searched one by one and for each predictors [features] the best split [classification] is found. Then the best single splits are compared. The process starts at the root and continues on until some rule is satisfied" and Schettini in page 271, Paragraph Results left-column, lines 2-6, states "we have experimented our approach on high-level classification of classifying of image either as photograph or an art artwork. Of course both the classes could be further split". This corresponds to if according to previously determined rules, any comparison is determinative of the input image, classifying the input in either the natural picture or graphics according to previously determined rules).

Regarding claim 6, edge feature includes at least one of an average number of pixels per connected edge and edge orientation (Schettini, page 270, Paragraph Image Description, left-column, lines 4-6, states "extract low-level representation in terms of color, texture and shape [edge] features" and Schettini, page 270, Paragraph Image Description, left-column, lines 30-35, states, "a histogram of filtered contours [edges] directions is computed". This corresponds

to edge feature includes at least one of an average number of pixels per connected edge and edge orientation).

Regarding claim 10, classification of an input image using a combination classifier (Schettini, in page 269, Paragraph Abstract, left-column, lines 2-5, states "classify color images in predefined classes, classification problem of distinguishing photographs from artworks" and Schettini, page 270, Paragraph Image Description, left-column, lines 1-6, states "significance of training set and quality of the features used to describe the image content are essential factors for good classification [combination picture/graphics classifier as using color, texture and edge features]. We have studied how to extract low-level representation in terms of color, texture and shape [edge] features". This corresponds to classification of an input image using a combination classifier),

performing a picture/graphics classifier on an input image using one or more edge feature (Schettini, page 270, Paragraph Image Description, left-column, lines 1-6, states "significance of training set and quality of the features used to describe the image content are essential factors for good **classification** . We have studied how to extract low-level representation in terms of color, texture and shape [edge] features" This corresponds performing a picture/graphics classifier on an input image using one or more edge, color and texture features),

if the result of the picture/graphics classifier using edge features is indeterminate, performing a classification using one or more one-dimensional color discreteness feature (Schettini, states in page 269, Paragraph Tree

Classifier, right-column, lines 12-13, states, "In our problem the **predictors are the features** indexing the images , Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the predictors [features/ color, edge and texture] are searched one by one and for the best split [classification] is found. Then the best single splits are compared. The process starts at the root and continues on until some rule is satisfied". In the system of Schettini all features such as color, edge and texture are used for classification and Schettini in page 271, Paragraph Results left-column, lines 2-6, states "we have experimented our approach on high-level classification of classifying of image either as photograph or an art artwork. Of course both the classes could be further split". In the system of Schettini, if the result of the picture/graphics classifier using edge features is indeterminate, Schettini system can perform a classification using one or more one-dimensional color discreteness feature or texture feature);

if the result of the picture/graphics classifier using color discreteness feature is indeterminate, performing a classification using one SGLD texture feature (Schettini, page 270, Paragraph Image Description, right-column, lines 1-5, states, "the estimation of statistical features based on the neighborhood Gray-tone Difference [SGLD texture feature] i.e coarsness, busyness, contrast are computed, Schettini page 269, Paragraph Tree Classifier, right-column, lines 12-13, states, "In our problem the **predictors are the features** indexing the images , Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the predictors [features/ color, edge

and SGLD texture] are searched one by one and for each predictors [features/ color, edge and texture] the best split [classification] is found. Then the best single splits are compared. The process starts at the root and continues on until some rule is satisfied". In the system of Schettini all features such as color, edge and texture are used for classification and Schettini in page 271, Paragraph Results left-column, lines 2-6, states "we have experimented our approach on high-level classification of classifying of image either as photograph or an art artwork. Of course both the classes could be further split". In the system of Schettini, if the result of the picture/graphics classifier using one-dimensional color features is indeterminate, Schettini system can perform a classification using SLGD texture feature and other features);

if the result of the picture/graphics classifier using SGLD texture is indeterminate, performing a classification using two-dimensional color feature (Schettini, page 270, Paragraph Image Description, right-column, lines 10-11, shows computing color distribution with respect to x and y axis, which is two dimensional color feature, Schettini page 269, Paragraph Tree Classifier, right-column, lines 12-13, states, "In our problem the **predictors are the features** indexing the images , Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the predictors [features/ two-dimensional- color feature , edge and texture] are searched one by one and for each predictors [features/ two-dimensional color, edge and texture] the best split [classification] is found. Then the best single splits are compared. The process starts at the root and continues on until some rule is satisfied". In

the system of Schettini all features such as two-dimensional color, edge and texture are used for classification and Schettini in page 271, Paragraph Results left-column, lines 2-6, states "we have experimented our approach on high-level classification of classifying of image either as photograph or an art artwork. Of course both the classes could be further split". In the system of Schettini, if the result of the picture/graphics classifier using SGLD texture feature is indeterminate, Schettini system can performs a classification using two-dimensional color feature and other features);

if the result of the picture/graphics classifier using two-dimensional color feature is indeterminate, performing a classification using three-dimensional color feature (Schettini, page 270, Paragraph Image Description, left-column, lines 24-26, shows a histogram of transition in color in CIELAB color space, histogram of color in CIELAB color space is three-dimensional because CIELAB color space is made of one luminance and two chrominance components, Schettini page 269, Paragraph Tree Classifier, right-column, lines 12-13, states, "In our problem the **predictors are the features** indexing the images , Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the predictors [features/ color distribution, three-dimensional color feature {CIELAB color histogram} , edge and texture] are searched one by one and for each predictors [features/ color, edge and texture] the best split [classification] is found. Then the best single splits are compared. The process starts at the root and continues on until some rule is satisfied". In the system of Schettini all features such as two dimensional color feature, three-

dimensional color feature , edge and texture are used for classification and Schettini in page 271, Paragraph Results left-column, lines 2-6, states "we have experimented our approach on high-level classification of classifying of image either as photograph or an art artwork. Of course both the classes could be further split". In the system of Schettini, if the result of the picture/graphics classifier using two-dimensional color feature is indeterminate, Schettini system can perform a classification using three-dimensional color feature and other features);

Regarding claim 11, edge feature includes at least one of an average number of pixels per connected edge and edge orientation (Schettini, page 270, Paragraph Image Description, left-column, lines 4-6, states "extract low-level representation in terms of color, texture and shape [edge] features" and Schettini, page 270, Paragraph Image Description, left-column, lines 30-35, states, "a histogram of filtered contours [edges] directions is computed". This corresponds to edge feature includes at least one of an average number of pixels per connected edge and edge orientation).

Regarding claim 15 classification of an input image using a combination classifier (Schettini, in page 269, Paragraph Abstract, left-column, lines 2-5, states "classify color images in predefined classes, classification problem of distinguishing photographs from artworks" and Schettini, page 270, Paragraph Image Description, left-column, lines 1-6, states "significance of training set and quality of the features used to describe the image content are essential factors for good classification [combination picture/graphics classifier as using color,

texture and edge features]. We have studied how to extract low-level representation in terms of color, texture and shape [edge] features". This corresponds to classification of an input image using a combination classifier),

performing a picture/graphics classifier on an input image using one or more edge feature (Schettini, page 270, Paragraph Image Description, left-column, lines 1-6, states "significance of training set and quality of the features used to describe the image content are essential factors for good **classification** . We have studied how to extract low-level representation in terms of color, texture and shape [edge] features" and Schettini, states in page 269, Paragraph Tree Classifier, right-column, lines 12-13, states, "In our problem the **predictors are the features** indexing the images , Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the predictors [features/ color, edge and texture] are searched one by one and for each predictors [features/ color, edge and texture] the best split [classification] is found. This corresponds to performing a picture/graphics classifier on an input image using one or more edge feature);

performing a picture/graphics classifier on an input image using one or more one-dimensional color feature (Schettini, page 270, Paragraph Image Description, left-column, lines 1-6, states "significance of training set and quality of the features used to describe the image content are essential factors for good **classification** . We have studied how to extract low-level representation in terms of color, texture and shape [edge] features" and Schettini, states in page 269, Paragraph Tree Classifier, right-column, lines 12-13, states, "In our problem

the **predictors are the features** indexing the images , Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the predictors [features/ color, edge and texture] are searched one by one and for each predictors [features/ color, edge and texture] the best split [classification] is found. This corresponds to performing a picture/graphics classifier on an input image using one or more color feature);

performing a picture/graphics classifier on an input image using one or more SGLD texture feature (Schettini, page 270, Paragraph Image Description, left-column, lines 1-6, states "significance of training set and quality of the features used to describe the image content are essential factors for good **classification** . We have studied how to extract low-level representation in terms of color, texture and shape [edge] features", Schettini, page 270, Paragraph Image Description, right-column, lines 1-5, states, "the estimation of statistical features based on the neighborhood Gray-tone Difference [SGLD texture feature] i.e coarsness, busyness, contrast are computed, and Schettini, states in page 269, Paragraph Tree Classifier, right-column, lines 12-13, states, "In our problem the **predictors are the features** indexing the images , Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the predictors [features/ color, edge and texture] are searched one by one and for each predictors [features/ color, edge and texture] the best split [classification] is found. This corresponds to performing a picture/graphics classifier on an input image using one or more SGLD texture feature);

performing a picture/graphics classifier on an input image using one or more two-dimensional color feature (Schettini, page 270, Paragraph Image Description, left-column, lines 1-6, states "significance of training set and quality of the features used to describe the image content are essential factors for good **classification** . We have studied how to extract low-level representation in terms of color, texture and shape [edge] features, Schettini, page 270, Paragraph Image Description, right-column, lines 10-11, shows color distribution with respect to x and y axis is computed, which is two dimensional color feature, and Schettini, states in page 269, Paragraph Tree Classifier, right-column, lines 12-13, states, "In our problem the **predictors are the features** indexing the images , Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the predictors [features/ two-dimensional color, edge and texture] are searched one by one and for each predictors [features/ color, edge and texture] the best split [classification] is found. This corresponds to performing a picture/graphics classifier on an input image using one or more two-dimensional color feature);

performing a picture/graphics classifier on an input image using one or more three-dimensional color feature (Schettini, page 270, Paragraph Image Description, left-column, lines 1-6, states "significance of training set and quality of the features used to describe the image content are essential factors for good **classification** . We have studied how to extract low-level representation in terms of color, texture and shape [edge] features, Schettini, page 270, Paragraph Image Description, left-column, lines 24-26, shows a histogram of

transition in color in CIELAB color space, histogram of color in CIELAB color space is three-dimensional feature because CIELAB color space is made of one luminance and two chrominance components, and Schettini, states in page 269, Paragraph Tree Classifier, right-column, lines 12-13, states, "In our problem the **predictors are the features** indexing the images , Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the predictors [features/ two-dimensional color, edge and texture] are searched one by one and for each predictors [features/ color, edge and texture] the best split [classification] is found. This corresponds to performing a picture/graphics classifier on an input image using one or more three-dimensional color feature);

comparing the results of the combination picture/graphics classifier for each feature selected for performance and (Schettini, page 269, Paragraph Tree Classifier, right-column, lines 12-13, states, "In our problem the **predictors are the features** indexing the images" and Schettini, in page 269, Paragraph Tree Classifier, right-column, lines 25-30, states "The candidate splits are generated by a set of question on values of predictors [features] , which are different depending on the nature of predictor [features]. For a numerical predictor [feature], the admissible question are {is x < c?} where x denotes the value of predictor [feature]"., Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the predictors [features] are searched one by one and for each predictors [features] the best split [classification] is found. Then the best single splits are compared. The

process starts at the root and continues on until some rule is satisfied". This corresponds to comparing the results of the combination picture/graphics classifier for each feature selected for performance),

if any comparison is determinative of the input image, classifying the input in either the natural picture or graphics according to previously determined rules, otherwise indicating the result is indeterminate (Schettini, page 269, Paragraph Tree Classifier, right-column, lines 30-35, states, "At each step of the process all the predictors [features] are searched one by one and for each predictors [features] the best split [classification] is found. Then the best single splits are compared. The process starts at the root and continues on until some rule is satisfied" and Schettini in page 271, Paragraph Results left-column, lines 2-6, states "we have experimented our approach on the specific high level classification [using color, texture and shape [edge] features]". This corresponds to performing combination of picture/graphics classification on input image using at least two features [edge, color discreteness and texture]);

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schettini et al. (Color Image Classification Using Tree Classifier, ITIM, IAMI, The Seventh Imaging Conference, Color Science, System and Application) in view of in view of Shafarenko et al. (Histogram Based Segmentation in perceptually uniform color space, IEEE 1057-7149/98).

Regarding claims 7 and 12, Schettini disclose two-dimensional include one or more of two dimensional color discreteness feature(Schettini, in page 270 left-column, lines 24-26, states "a histogram of the transition of colors in CIELAB color space is computed, which is three dimensional color feature, CIELAB color is made two chrominance channel [AB] and one luminance channel [L], CIELAB color space consist of two-dimensional features which are two chrominance [AB] channel, one luminance and one chrominance [LA] channel and one luminance and one chrominance [LB]),

each two dimensional color discreteness feature representing two color of a predetermined color space comprised of three color channel (Schettini, in page 270 left-column, lines 24-26, states "a histogram of the transition of colors in CIELAB color space is computed, which is three dimensional color feature which obviously made of two-dimensional and one-dimensional color feature, two chrominance [AB] channel, one luminance and one chrominance [LA] channel and one luminance and one chrominance [LB] represent two-dimensional color feature in CIELAB color space).

Schettini however has not explicitly shown two-dimensional color discreteness feature represent the possible combination of two color channel.

In the same field of endeavor Shafarenko shows two-dimensional color discreteness feature represent the possible combination of two color channel (Shafarenko, page 1358, left-column, second paragraph, lines 1-4, shows 2D histogram of uv in Luv color space).

Therefore it would have obvious at the time the invention was made to use two-dimensional color discreteness feature as the possible combination of two color channel in the system of Schettini by replacing one color space CIELAB by another CIELUV color space as shown by Shafarenko because Luv color space is used in image recognition and classification in which the Euclidean distance between two points is proportional to the perceptual difference between the two colors represented by these points thereby providing verifiable classification/recognition of images.

10. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schettini et al. (Color Image Classification Using Tree Classifier, ITIM, IAMI, The Seventh Imaging Conference, Color Science, System and Application) in view of Revankar et al. (US 5,767,978).

Regarding claim 16, Schettini discloses producing an output of image associated with an input image based on the classification (Schettini, in page 269, Paragraph Abstract, left-column, lines 2-5, states "classify color images in predefined classes, classification problem of distinguishing photographs from artworks". producing an output of image associated with an input image based on the classification) comprising;

extracting one or more feature from the input image, two or more features are selected from texture, edge one-dimensional features (Schettini, page 270, Paragraph Image Description,left-column, lines 1-6, states "training set and quality of the features used to describe the image content essential for good classification of image", also states "extracting low-level representation in terms of color, texture and shape [edge] features", This corresponds to extracting one or more feature from the input image, two or more features are selected from texture, edge one-dimensional features).

binary classifier for classifying the input image in picture or graphics classes using a combination of any two extracted features (Schettini, page 270, Paragraph Image Description,left-paragraph, lines 1-6, states "training set and quality of the features used to describe the image content essential for good classification of image", also states "extract low-level representation in terms of color, texture and shape features", and Schettini in page 271, Paragraph Results left-column, lines 2-5, states "we have experimented our approach on high-level classification of classifying of image either as photograph or an art artwork [binary classifier]". All this corresponds to binary classifier for classifying the input image in picture or graphics classes using a combination of two extracted features).

Schettini has not explicitly disclosed a picture and a graphic module for processing the input image using piciture or graphics and a switch for routing the input image based on the classification.

In the same field of endeavor Revankar discloses a picture and a graphic module for processing the input image using picture or graphics image processing function (Revankar, col. 8, lines 54-65, graphics and picture are separated into class, some rendering techniques are suitable for rendering [processing] pictures and some are good for graphics". Furthermore in figure 1 Ravankar shows a picture and a graphic module for processing classified image and the classified image is routed to these module based on the classification result. This corresponds to a picture and a graphic module for processing the input image using picture or graphics image processing function such as shown in figure 1) and

a switch for routing the input image based on the classification (Revankar in figure 1 shows conditional statement of classification and then the image is routed based on the image classification which is for process region as pictorial image or process region as graphic image which corresponds to a switch for routing the input image based on the classification).

Therefore it would have been obvious at the time the invention was made to use a picture and a graphic module for processing the input image and a switch for routing the input image based on the classification result as shown by Revankar in the system of Schettini because such a system provide optimum image processing techniques for processing the classified graphics or pictorial image.

Regarding claim 17, edge feature includes at least one of an average number of pixels per connected edge and edge orientation (Schettini, page 270,

Paragraph Image Description, left-column, lines 4-6, states "extract low-level representation in terms of color, texture and shape [edge] features" and Schettini, page 270, Paragraph Image Description, left-column, lines 30-35, states, "a histogram of filtered contours [edges] directions is computed". This corresponds to edge feature includes at least one of an average number of pixels per connected edge and edge orientation).

11. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schettini et al. (Color Image Classification Using Tree Classifier, ITIM, IAMI, The Seventh Imaging Conference, Color Science, System and Application) in view of Revankar et al. (US 5,767,978) as applied to claims 16-17 and further in view of Shafarenko et al. (Histogram Based Segmentation in perceptually uniform color space, IEEE 1057-7149/98).

. Regarding claim 18, Schettini disclose two-dimensional include one or more of two dimensional color discreteness feature(Schettini, in page 270 left-column, lines 24-26, states "a histogram of the transition of colors in CIELAB color space is computed, which is three dimensional color feature, CIELAB color is made two chrominance channel [AB] and one luminance channel [L], CIELAB color space consist of two-dimensional features which are two chrominance [AB] channel, one luminance and one chrominance [LA] channel and one luminance and one chrominance [LB]),

each two dimensional color discreteness feature representing two color of a predetermined color space comprised of three color channel (Schettini, in page 270 left-column, lines 24-26, states "a histogram of the transition of colors in

CIELAB color space is computed, which is three dimensional color feature which obviously made of two-dimensional and one-dimensional color feature, two chrominance [AB] channel, one luminance and one chrominance [LA] channel and one luminance and one chrominance [LB] represent color of in CIELAB color space).

Schettini and Revankar however have not explicitly shown two-dimensional color discreteness feature represent the possible combination of two color channel.

In the same field of endeavor Shafarenko two-dimensional color discreteness feature represent the possible combination of two color channel (Shafarenko, page 1358, left-column, second paragraph, lines 1-4, shows 2D histogram of uv in Luv color space).

Therefore it would have obvious at the time the invention was made to use two-dimensional color discreteness feature as the possible combination of two color channel in the system of Schettini by replacing one color space CIELAB by another CIELUV color space as shown by Shafarenko because Luv color space is used in image recognition and classification in which the Euclidean distance between two points is proportional to the perceptual difference between the two colors represented by these points thereby providing verifiable classification/recognition of images.

Allowable Subject Matter

12. Claims 3-4, 8-9, 13-14 and 19-20 are objected as being dependent on rejected base claim but would be allowable over prior art of record if rewritten in independent form including limitation of the base claim and any intervening claims and also provided that claims overcome rejection under 35 USC 112 second paragraph.

Contact Information

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sherali Ishrat whose telephone number is 703-308-9589. The examiner can normally be reached on 8:00 AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Au Amelia can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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